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DATE: Friday, August 20, 2004

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<input type="checkbox"/>	L2	L1 with (fusion or hybrid)	3
<input type="checkbox"/>	L1	rubredoxin	128

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☐ 1. Document ID: US 20030219402 A1

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L2: Entry 1 of 3

File: PGPB

Nov 27, 2003

PGPUB-DOCUMENT-NUMBER: 20030219402

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030219402 A1

TITLE: Chimeric molecules for cleavage in a treated host

PUBLICATION-DATE: November 27, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Rutter, William J.	San Francisco	CA	US	

US-CL-CURRENT: 424/85.1; 424/185.1, 424/195.15, 424/725, 424/94.1, 514/2, 514/44,  
514/54, 514/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWNC	Draw D
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☐ 2. Document ID: US 20020193566 A1

L2: Entry 2 of 3

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020193566

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020193566 A1

TITLE: Thermodynamic propensities of amino acids in the native state ensemble:  
implications for fold recognition

PUBLICATION-DATE: December 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hilser, Vince	Galveston	TX	US	
Fox, Robert O.	Galveston	TX	US	

US-CL-CURRENT: 530/350; 702/19, 703/11

h e b b g e e f e f e f b e

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw De
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☐ 3. Document ID: WO 200039310 A1, AU 200024869 A

L2: Entry 3 of 3

File: DWPI

Jul 6, 2000

DERWENT-ACC-NO: 2000-452403

DERWENT-WEEK: 200050

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TITLE: Nucleic acids encoding fusion peptides comprising rubredoxin, useful as vaccines

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KMC	Draw De
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Terms	Documents
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NEWS 3 May 12 EXTEND option available in structure searching  
NEWS 4 May 12 Polymer links for the POLYLINK command completed in REGISTRY  
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SDIs in Caplus  
NEWS 6 May 27 Caplus super roles and document types searchable in REGISTRY  
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> s rubredoxin  
L 3496 RUBREDOXIN

> s l1 (5a)(fusion or hybrid)  
2 13 L1 (5A)(FUSION OR HYBRID)

> dup rem l2  
PROCESSING COMPLETED FOR L2  
3 5 DUP REM L2 (8 DUPLICATES REMOVED)

> d 1-5

B ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2004 ACS on STN  
N 2003:289627 HCAPLUS  
N 140:73480  
I A Rubredoxin based system for screening of protein expression conditions  
and on-line monitoring of the purification process  
J Kohli, Bernhard M.; Ostermeier, Christian  
S Biozentrum, Basel, Switz.  
D Protein Expression and Purification (2003), 28(2), 362-367  
CODEN: PEXPEJ; ISSN: 1046-5928  
B Elsevier Science  
T Journal  
A English

E.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

B ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2004 ACS on STN  
N 2002:5909 HCAPLUS  
N 136:130993  
I Separation of MBP fusion proteins through affinity membranes  
J Cattoli, Francesca; Sarti, Giulio C.  
S Dipartimento di Ingegneria Chimica Mineraria e delle Tecnologie  
Ambientali, Universita di Bologna, Bologna, 40136, Italy  
D Biotechnology Progress (2002), 18(1), 94-100  
CODEN: BIPRET; ISSN: 8756-7938  
B American Chemical Society  
T Journal  
A English

E.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

B ANSWER 3 OF 5 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN  
N DUPLICATE 1  
I 2000-12219 BIOTECHDS  
Nucleic acids encoding \*\*\*fusion\*\*\* proteins containing  
\*\*\*rubredoxin\*\*\*, useful as vaccines;

plasmid PRUBEX3-mediated *Desulfovibrio vulgaris* gene transfer and  
expression in host cell for recombinant vaccine

Przybyla A; Menon N  
Univ.Georgia-Res.Found.

Athens, GA, USA.

WO 2000039310 6 Jul 2000

WO 1999-US31176 29 Dec 1999

US 1998-114034 29 Dec 1998

Patent

English

WPI: 2000-452403 [39]

ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2004 ACS on STN

1998:556264 HCAPLUS

129:272019

Inadequacies of the Point-Dipole Approximation for Describing  
Electron-Nuclear Interactions in Paramagnetic Proteins: Hybrid Density  
Functional Calculations and the Analysis of NMR Relaxation of High-Spin  
Iron(III) Rubredoxin

Wilkins, Steven J.; Xia, Bin; Volkman, Brian F.; Weinhold, Frank; Markley,  
John L.; Westler, William M.

National Magnetic Resonance Facility at Madison Department of  
Biochemistry, University of Wisconsin Madison, Madison, WI, 53706, USA

Journal of Physical Chemistry B (1998), 102(42), 8300-8305

CODEN: JPCBFK; ISSN: 1089-5647

American Chemical Society

Journal

English

E.CNT 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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ANSWER 5 OF 5 MEDLINE on STN

DUPLICATE 2

95400495 MEDLINE

PubMed ID: 7670642

Two genes encoding proteins with similarities to rubredoxin and rubredoxin  
reductase are required for conversion of dodecane to lauric acid in  
*Acinetobacter calcoaceticus* ADP1.

Geissdorfer W; Frosch S C; Haspel G; Ehrt S; Hillen W

Lehrstuhl für Mikrobiologie, Friedrich-Alexander Universität

Erlangen-Nürnberg, FRG.

Microbiology (Reading, England), (1995 Jun) 141 ( Pt 6) 1425-32.

Journal code: 9430468. ISSN: 1350-0872.

ENGLAND: United Kingdom

Journal; Article; (JOURNAL ARTICLE)

English

Priority Journals

GENBANK-Z46863

199510

Entered STN: 19951026

Last Updated on STN: 19970203

Entered Medline: 19951013

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ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2004 ACS on STN

High-level, all-electron, d. functional calcns. have been used, in  
conjunction with high-resoln. x-ray structural data, to predict, and to  
compare with expt., the contribution of unpaired electrons to the  
relaxation times for <sup>15</sup>N nuclei in oxidized *Clostridium pasteurianum*  
rubredoxin. Published x-ray structures for the iron(III) rubredoxin from  
*C. pasteurianum* were employed to construct a 104-atom model for the iron  
center that included all atoms shown to have strong electronic  
interactions with the unpaired iron electrons. The remainder of the amide  
nitrogen resonances in the protein, which show no apparent Fermi contact  
contribution to the chem. shift, are represented in the model by ghost  
atoms (atoms with no charge or basis functions). This model served as a  
starting point for quantum mech. calcns. at the B3LYP/6-311G\*\* level,  
which, in turn, yielded calcd. values for eigenvalues of the  
spin-differential field gradient tensor, which finally yielded expectation  
values for effective distances between nuclei and the delocalized spin-d.  
We report here that using effective distances, which are calcd. from the  
spin-differential field gradient tensor, in the Solomon-Bloembergen  
equation in place of distances measured from the crystal structures  
greatly improves the correlation for a plot of exptl. relaxation rates vs.  
r<sup>-6</sup> for <sup>15</sup>N resonances in *C. pasteurianum* iron(III) rubredoxin. With

increases in the speed of computers and algorithms, iterative quantum chem. optimization of paramagnetic center geometries based on NMR-derived distance and angular constraints from paramagnetic interactions should lead to significant improvements in the detn. of the structures of paramagnetic centers in proteins by NMR spectroscopy.

ANSWER 5 OF 5 MEDLINE on STN DUPLICATE 2  
Mutants of Acinetobacter calcoaceticus ADP1 unable to grow on dodecane, but retaining the ability to grow on lauric acid were isolated after ethylmethanesulphonate (EMS) treatment. This growth deficiency was complemented by a clone from a gene library constructed from chromosomal DNA of the wild-type strain. The complementing DNA mapped in a gene encoding a polypeptide with homology to rubredoxins. The deduced putative rubredoxin amino acid sequence is more similar to related proteins from Gram-positive bacteria than to the Pseudomonas oleovorans rubredoxin involved in alkane oxidation. An adjacent gene encodes a protein with similarity to rubredoxin reductase from Pseudomonas oleovorans and related NAD(P)-dependent reductases. Disruption of the rubredoxin-encoding gene by insertion of a KmR/lacZ cassette rendered the resulting strain unable to grow on dodecane or hexadecane. This demonstrates that these genes are necessary for alkane degradation. Transcriptional \*\*\*fusion\*\*\* of lacZ to the \*\*\*rubredoxin\*\*\* -encoding gene led to low level constitutive beta-galactosidase expression, whereas the fusion oriented in the opposite direction was not expressed.

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3496 S RUBREDOXIN  
13 S L1 (5A)(FUSION OR HYBRID)  
5 DUP REM L2 (8 DUPLICATES REMOVED)

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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> C12N 15/62, 15/31, 15/70, 1/21, C07K 19/00, 14/195, 16/00, A61K 39/02, C07K 14/47, C12N 15/12, C07K 14/72, 16/28, 14/575, C12N 15/16, 15/17, C07K 14/62	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 00/39310</b> <b>(43) International Publication Date:</b> 6 July 2000 (06.07.00)
<b>(21) International Application Number:</b> PCT/US99/31176 <b>(22) International Filing Date:</b> 29 December 1999 (29.12.99)  <b>(30) Priority Data:</b> 60/114,034 29 December 1998 (29.12.98) US  <b>(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application</b> US 60/114,034 (CON) Filed on 29 December 1998 (29.12.98)  <b>(71) Applicant (for all designated States except US):</b> THE UNIVERSITY OF GEORGIA RESEARCH FOUNDATION, INC. [US/US]; Boyd Graduate Studies Research Center, Athens, GA 30602-7411 (US).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> PRZYBYLA, Alan [US/US]; 355 Rambling Road, Athens, GA 30606 (US). MENON, Nanda [US/US]; 205 Brookstone Drive, Athens, GA 30605 (US).	<b>(74) Agent:</b> SANDBERG, Victoria, A.; Muetting, Raasch & Gebhardt, P.A., P.O. Box 581415, Minneapolis, MN 55458-1415 (US).  <b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
<b>(54) Title:</b> RUBREDOXIN FUSION PROTEINS, PROTEIN EXPRESSION SYSTEM AND METHODS  <b>(57) Abstract</b>  A recombination fusion protein is presented which comprises rubredoxin as the fusion partner. The fusion protein optionally includes an intervening spacer region between the rubredoxin constituent and the fused polypeptide of interest that can contain a proteolytic cleavage site for release of the polypeptide of interest. The fusion protein can contain one or more sites for affinity purification. The invention also includes methods and materials for making and using the rubredoxin fusion protein. Also provided are antigenic compounds and compositions, including vaccines, comprising a rubredoxin as a carrier molecule linked to an antigen or hapten.		